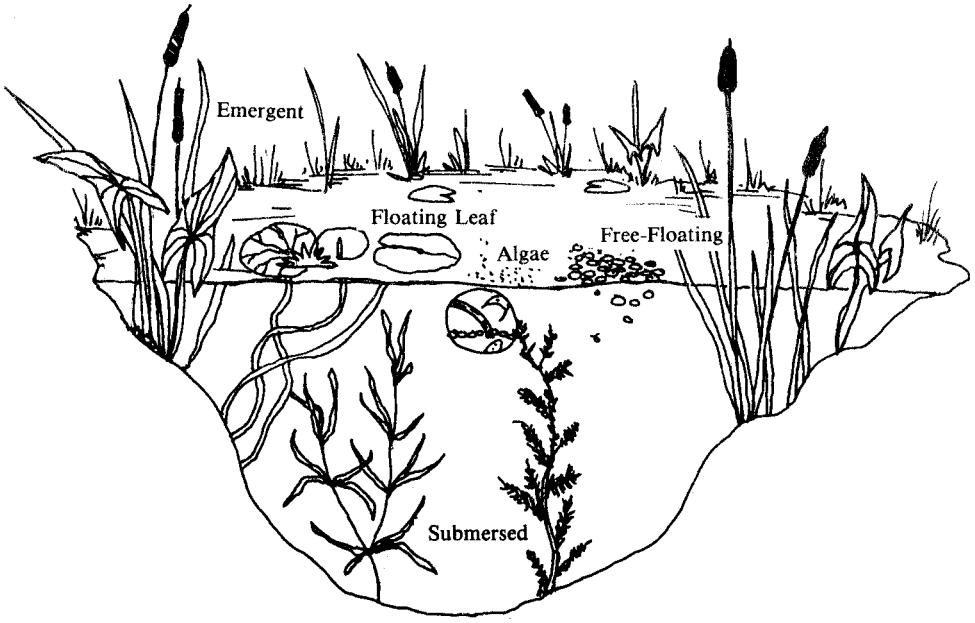
AQUAGUIDE

MISSOURI DEPARTMENT OF CONSERVATION

Duckweed and Watermeal Control in Missouri Lakes and Ponds



Aquatic plants are a beneficial and necessary part of Missouri fishing lakes and ponds. Without plants, many other aquatic organisms would not survive. Plants add oxygen to water, provide food, cover and nesting sites for fish and insects, and stabilize the shoreline and bottom against erosion and turbidity. Refer to our March 1993 publication, "Nuisance Aquatic Plants in Missouri Ponds and Lakes," for information on the identification of aquatic vegetation, and the benefits and drawbacks of having aquatic plants in your pond.

Duckweed and watermeal are examples of free floating plants that are commonly found in Missouri waters (see diagram). Duckweed and watermeal are fast growing aquatic plants that can sometimes reach nuisance densities in less than one month. Small amounts of these plants will not harm a good pond, but dense growths can block sunlight, reduce oxygen concentrations and upset the natural pond balance.

Mechanical, biological and chemical control of aquatic plants are options available to the pond owner.

MECHANICAL CONTROL

1. Seining with small mesh nets or with window-screen material can reduce coverage of free-floating plants in a small pond. Since free-floating plants reproduce so quickly, mechanical methods are only temporary solutions. However, temporary control may be all you need to enjoy a fishing trip or a swimming party.

2. Dense growth of duckweed or watermeal is usually linked to high levels of nutrients in the water. Nutrients like nitrogen and phosphorous can come from waterfowl waste, septic tank seepage, feedlot runoff, uneaten fish food or fertilizer washed off fields, pastures or lawns. Eliminating or diverting these nutrient sources will reduce the chance of having problems with duckweed or watermeal. If the pond is old and has become shallow due to accumulation of black muck on the bottom, it may be necessary to drain, dry and deepen the pond. The black muck is a storehouse of

nutrients that fuel the excessive growth of aquatic plants. All excavated material should be removed from the pond's watershed.

BIOLOGICAL CONTROL

The grass carp (*Ctenopharyngodon idella*), or white amur, is a plant eating Asian member of the minnow family used to control certain species of aquatic plants. Grass carp may eat some duckweed and watermeal, but these plants reproduce so quickly that they can cover a one acre pond in two months. For this reason, grass carp are generally not an effective control measure.

CHEMICAL CONTROL

1. **ALWAYS READ THE PRODUCT LABEL FOR DIRECTIONS, CURRENT RESTRICTIONS AND WARNINGS.** Some considerations may include potential contamination of domestic water supplies and waiting periods for watering livestock, eating fish, swimming and irrigation.

2. Although they provide good control when applied correctly, herbicides may also harm desirable organisms, if used improperly. The decay of large amounts of dead plant material following chemical application can lower dissolved oxygen to lethal levels for fish. For this reason, it is recommended to treat only one-third of the plants at seven to ten day intervals until control is obtained. Chemical control can be very expensive and it isn't permanent; continuous re-treatment will be necessary. Please remember that the long-term effects of most herbicides on the environment are not well known.

3. Duckweed and watermeal grow very fast. For this reason, chemical control should begin as soon as the plants appear in the spring.

CHEMICAL CONTROL

Currently recommended herbicides for Duckweed and Watermeal control and their suggested retail prices. Though these chemicals have been tested by MDC and have proven reliable other chemicals may be suitable for aquatic weed control.

	Sonar-AS	Reward	Weedtrine-D	✦ Reward and Cutrine Plus Liquid
Duckweed *(Lemna spp.)*	approved	approved	approved	approved
Watermeal *(Wolffia spp.)*	approved	approved	approved	approved
Minimum Quantity Available	1 pint	1 quart	1 gal.	Cutrine Plus 1 gallon
Approx. price per unit	$250.00	$122.70	$57.50	$30.00

When using Reward, Weedtrine-D, or Reward/Cutrine Plus Liquid, the following recommendations should be followed:

1. Add a non-ionic surfactant at the rate of 3/4 ounces per gallon of water.

2. Use a fine spray when spraying the vegetation.

3. Do not treat when the pond is muddy.

4. Treat when the water surface is calm.

5. Treat any Duckweed that may be washed up on bank.

✦ Mix at a rate of 1/3 Cutrine Plus to 2/3 Reward. Dilute this solution at the rate of one part of mix to fourteen parts of water (one quart of solution to 3.5 gallons of water). Add 2.6 ounces of non-ionic surfactant. This quantity will treat 1/4 acre of water.

Local farm supply stores often carry, or will order, these herbicides. For alternate sources of chemicals, a copy of a product label or clarification of this Aquaguide, check with your Fisheries Regional office or visit our web-site at www.conservation.state.mo.us. Other Aquaguides on aquatic weed control are also available.

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Determination of Acre-Feet to Calculate Total Amount of Herbicide Needed

If the acreage of the area to be treated is known, the number of acre-feet can be determined by multiplying the number of acres by the average depth (average depth = 1/3 of the maximum depth). For example: A two acre pond is to be treated and has an average depth of three feet. The volume of the water is six acre-feet.

2 acres x 3 feet (average depth) = 6 acre-feet

If the dosage of herbicide recommended is 2 gallons of herbicide per acre-foot, the total herbicide needed would be twelve gallons.

6 acre-feet x 2 gal/acre-foot = 12 gallons (total herbicide needed)

If the number of acres is not known, it can be estimated by measuring the number of square feet and dividing by 43,560. The number of square feet in many cases can be closely approximated by multiplying the average width in feet by the average length in feet. For example: A shoreline area is to be treated. The weeded area is 500 feet long and averages 10 feet wide. The total surface area is 5,000 square feet or 0.115 acres.

$$10 \text{ feet} \times 500 \text{ feet} = 5{,}000 \text{ square feet}$$

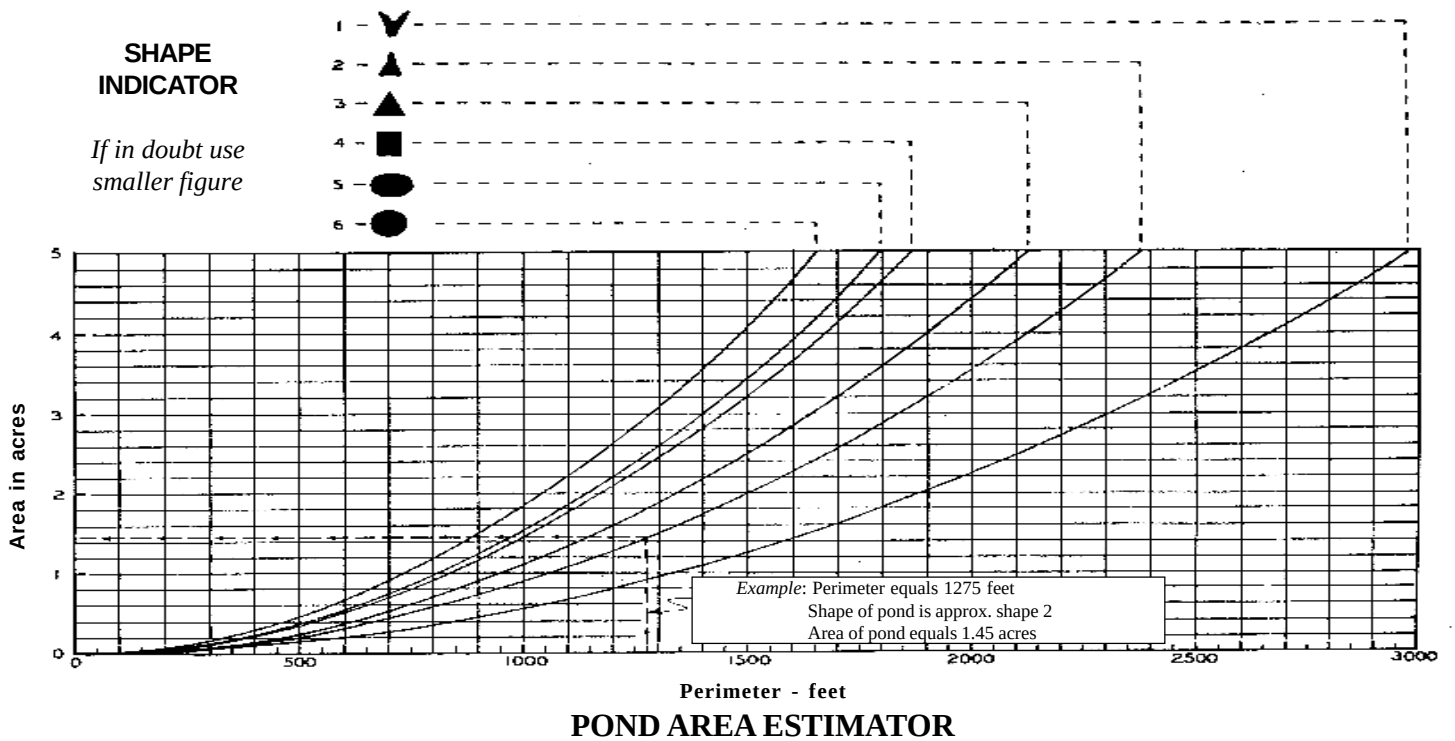
$$\frac{5{,}000 \text{ square feet}}{43{,}560 \text{ (square feet in an acre)}} = 0.115 \text{ acres}$$

The average depth of water in this shoreline area is 1 foot. The total acre-feet is 0.115.

0.115 acres x 1 foot (average depth) = 0.115 acre-feet

If we assume that 4 gal/acre-foot was the recommended dosage, then 0.46 gallons of herbicide would be needed.

4 gal/acre-foot x 0.115 (acre feet) = 0.46 gallons (total herbicide needed)



POND AREA ESTIMATOR